MARSHALL STAR
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X-33 metallic heat shield 'ready for flight'

by Tony Jacob

Development of a low-cost space plane took a step forward last month when one of three technologies essential to its success was declared "ready for flight."

The rugged, metallic thermal-protection panels designed for NASA's X-33 technology demonstrator passed an intensive test series that included sessions in high-speed, high-temperature wind tunnels. The panels also were strapped to the bottom of a NASA F-15 aircraft and flight-tested at nearly 1.5 times the speed of sound.

The X-33 program is under the Space Transportation Programs Office at Marshall.

Additional laboratory tests duplicated the environment the X-33's outer skin will encounter while flying roughly 60 miles high at more than 13 times the speed of sound. Also, a thermal-panel fit test successfully demonstrated the ease of panel installation and removal.

The thermal protection system combines aircraft and space-plane design, using easy-to-maintain metallic panels placed over insulating material. As the X-33 flies through the upper atmosphere, the panels will protect the vehicle from aerodynamic stress and temperatures comparable to those a reusable launch vehicle would encounter while re-entering Earth's atmosphere.

Tests have verified that the metallic thermal-protection system will protect vehicles from temperatures near 1,800 degrees Fahrenheit.

"NASA is focusing on creating a next generation of reusable launch vehicles that will dramatically cut the costs associated

*See **Metallic heat shield** on page 6*

NASA photo by Emmett Given

Center Director Stephenson hosts Contractor Breakfast

Marshall Center Director Art Stephenson, right, welcomes Dr. Frank Franz, president of the University of Alabama in Huntsville, to the Contractor Breakfast Feb. 5 at Marshall. Stephenson discussed the Center's mission, roles and reorganization with approximately 30 Science & Engineering Directorate support contractors. It was the first in a series of contractor meetings planned by Stephenson.

NASA photo by Doug Stoffer

Customer and Employee Relations Directorate celebrates first anniversary

Tereasa Washington, director of Marshall's Customer and Employee Relations Directorate (CaER) welcomes CaER employees and contractors to the Rustic Lodge on Redstone Arsenal last Friday for a program to mark the directorate's first full year of operation. The anniversary celebration featured skits by employees from each CaER Office. The skits illustrated each organization's accomplishments in 1998 and highlighted plans for 1999. The skits were judged by Dave Bates, chief financial officer; Sheila Cloud, director of the Center Operations Directorate; and Jim Ellis, assistant director of that directorate. See pages 4 and 5 for more photos.

"Safety is the best way"

— Safety slogan submitted by
Philisha Mathews, EP61

Polites named Distinguished Engineering Fellow

Dr. Michael Polites, deputy director of the Astrionics Laboratory in Marshall's Science and Engineering Directorate, has been selected as a 1999 Distinguished Engineering Fellow of the University of Alabama College of Engineering, Tuscaloosa.

Dr. Michael Polites

Polites will be honored at a ceremony during the college's Fellows Reunion Weekend May 7-8. Selection as a Distinguished Engineering Fellow at the University of Alabama is the highest honor awarded by the College of Engineering.

Polites, who has served as the Astrionics Laboratory director since March 1998, joined Marshall in 1967 as an aerospace engineer in the Guidance and Control Division of the Astrionics Laboratory. He also has served as Instrumentation and Control Division chief of that lab, and was assigned to the Systems Engineering Division, Systems Analysis and Integration Laboratory.

Electrical violations most common safety discrepancy at Marshall

by Judy Milburn

Approximately one-third of the safety violations entered into Marshall's Industrial Safety Office Hazard Identification data base in 1998 were electrical violations.

The Industrial Safety Office urges employees to check for the following possible electrical discrepancies:

- Heat producing appliances not having the required permits posted, e.g., coffee pots, microwaves, hot plates, etc.
- Strain relief missing and/or defective on electrical plug
- Electrical power cord defective
- Electrical receptacles and/or covers missing or defective
- Extension cords run through doorways, under carpets, through walls, etc.
- Extension cords used where permanent wiring should be installed
- Extension cords constructed with material not UL approved
- Exposed electrical wiring presenting potential shock hazard

All Marshall Center employees and on-site contractors can help eliminate these problems by requesting a permit for heat-producing appliances, using single power strips, and reporting electrical violations to supervisors and safety monitors, Safety Concerns Reporting System, or by calling the Safety Hotline at 544-0046.

The writer works in Marshall's Industrial Safety Office.

NASA photo by Terry Leibold

Schwinghamer honored

Center Deputy Director Carolyn Griner presents the Distinguished Service Medal to Robert Schwinghamer, Marshall's associate director, technical, during a retirement reception held in his honor Feb. 2 at Marshall.

Marshall Star now published Thursdays

The publication and distribution day of the Marshall Star has changed from Wednesday to Thursday beginning with today's issue.

This change provides extra time for gathering news from late Friday, weekend or Monday events — offering readers a fresher, more vital publication. Also, by distributing the Marshall Star on Thursdays, federal holidays will no longer significantly interfere with final editing and production.

The deadline for submitting contributions for consideration in the Marshall Star is noon Monday prior to the publication day. Submissions may be mailed to Marshall's Internal Relations and Communications Office, CO40, Bldg. 4200, room 101; faxed to 544-0007; or e-mailed to:
angela.storey@msfc.nasa.gov
ann.bryk@msfc.nasa.gov

For more information, readers may contact the Marshall Star Office at 544-0030.

'Caught on tape'

Marshall Center may aid law enforcement through video enhancement technology

by Mary Ann Jefferson

Marshall Center technology soon may help law enforcement officials around the country solve crimes with Video Image Stabilization and Registration (VISAR), a new concept in clear video imagery.

At the request of law enforcement officials, NASA developed VISAR for use in a recent crime scene. Impressed by the results, the Los Alamos National Laboratory, N.M., concluded that VISAR was unsurpassed in its clarification of blurred and unstable video images.

Recently, VISAR was introduced at a conference sponsored by the Office of Law Enforcement Technology Commercialization, part of the National Institute of Justice. VISAR inventors David Hathaway of Marshall's Space Sciences Laboratory, Paul Meyer of the Global Hydrology and Climate Center, Sammy Nabors of the Technology Transfer Office, along with Jody Page of Research Triangle Institute, N.C., demonstrated VISAR's technology and commercialization potential to innovators, venture capitalists, manufacturers and law enforcement representatives.

From left, VISAR innovators Paul Meyer of the Global Hydrology and Climate Center at Marshall and David Hathaway, Solar Physics Group leader in the Center's Space Sciences Lab; partner with Sammy Nabors, lead of the Commercialization Assistance Team in the Technology Transfer Office. Nabors assists innovators with commercialization of technology.

Using a prepared video of a mock car chase, VISAR was able to clarify the license plate of the car. In another example, using home video news coverage of an Ireland bombing in the fall of 1998, VISAR clarified the face of a person in a crowd. The face was a complete blur in the original version.

The VISAR technology improves the clarity of video footage by correcting distortion caused by adverse conditions. VISAR stabilizes camera rotation and zoom effects; produces clearer images of moving objects; smoothes jagged edges; enhances still images; and reduces video noise or "snow." After the footage has been "cleaned up" it can be further enhanced through sharpening and deblurring techniques.

The Chief Counsel's Office at Marshall filed a provisional patent for VISAR and the Technology Transfer Office is seeking to commercialize the technology with licenses to U.S. companies. An industry briefing is scheduled for March 24 by Marshall and the Research Triangle Institute.

The writer, a contractor employed by Scientific and Commercial Systems Corporations, supports the Technology Transfer Office at Marshall.

NASA photo by Dennis Olive

Turbopump testing continues at Marshall

Marshall Center engineers tested the Fastrac engine turbopump component Feb. 4 at the Center. The Marshall-designed and -developed Fastrac is a 60,000-pound-thrust engine that will be used for the first powered flight of NASA's X-34 demonstrator.

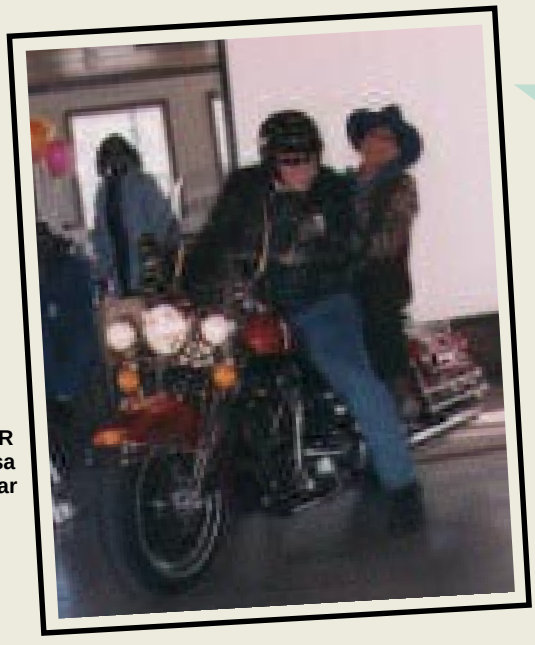
1998 accomplishments & team building are focus of celebration

Employees from CaER's Technology Transfer Office spell out their 1998 accomplishments.

The CaER Director's Office employees illustrate the process used in 1998 of rounding 'em up and heading 'em in to form the Customer and Employee Relations Directorate.

CaER's Human Resources Office weathers the storms and seas of buyouts, reorganizations and a host of other issues to illustrate its 1998 accomplishments.

"Somehow, somewhere over the rainbow" in 1998, CaER's Employee and Organizational Development Office find what it takes to respond to the Center's multitude of training and development needs.



Chief Financial Officer Dave Bates and CaER Director Tereasa Washington roar into the Rustic Lodge to kick-start CaER's one-year anniversary celebration.

Jim Ellis, Dave Bates and Sheila Cloud serve as judges at the CaER celebration.

To illustrate the rigors of routinely working media requests, interviews, issues, releases and more, in 1998, employees of CaER's Media Relations Office take a bow and tip their hats to the crowd at last week's celebration.

CaER employees sample the food and festivities at CaER's anniversary event.

CaER's Government and Community Relations Office employees lighten up from the daily pressures of scheduling dignitaries and visitors to the Marshall Center in 1998 in a skit depicting their work.

CaER's Internal Relations and Communications Office takes the stage to play "Wheel of Future" in a sketch communicating its 1998 accomplishments.

A panel of "scholars" from CaER's Education Programs Office gathers 'round to present their 1998 accomplishments.

Metallic heat shield

Continued from page 1

with getting into space," said Dan Dumbacher, X-33 deputy program manager assigned to the Marshall Center.

"One way to cut costs is to design rugged systems that require less maintenance and that are more airplane-like in their operations," Dumbacher said.

"By developing and proving these systems, we're creating the ability to build space planes that eventually will fly to orbit, return for servicing, and launch again as often as today's commercial airplanes make scheduled flights," he added.

The Marshall Center is NASA's lead center for developing future space transportation systems.

The remaining two technologies important for low-cost space access are an efficient propulsion system ideally suited to power a lifting body and, more importantly, lightweight-yet-strong composite cryogenic fuel tanks and structures to minimize vehicle weight. Work on those two challenging technologies continues as the X-33 program enters a phase of intense testing and qualification of the vehicle's components.

NASA expects the metallic thermal-protection panels — developed and built by team member BF Goodrich Aerospace/ Aerostructures Group in Chula Vista, Calif. — to dramatically cut maintenance time and costs associated with more fragile thermal-tile systems. Because the metallic panels on the lower surfaces of the X-33 make up the vehicle's windward, aerodynamic structural shell, the system also will obtain significant weight savings over traditional thermal systems, while being much more durable and waterproof.

Photo courtesy of Lockheed Martin Skunk Works

The metallic panels that make up the thermal protection system on the X-33's underside consist of the alloy Inconel over a foil bag containing insulating material.

Photo courtesy of Lockheed Martin Skunk Works

Six flights have been flown using NASA's F-15B Aerodynamic Flight Facility aircraft to test the durability of the thermal protection system materials at flight velocities above the speed of sound.

The X-33 is a half-scale technology demonstrator of a full-scale, commercially developed reusable launch vehicle (RLV) which Lockheed Martin has named "VentureStar," planned for development after the turn of the century. Through airplane-like operations and a single-stage-to-orbit design, a full-scale RLV could dramatically reduce the cost of putting payloads into space from $10,000 per pound to $1,000 per pound.

The X-33 is scheduled to make as many as 15 test flights from Edwards Air Force Base, Calif., to Dugway Proving Ground, Utah, and Malmstrom Air Force Base, Mont., beginning in 2000.

Although suborbital, the X-33 will fly high enough and fast enough to encounter conditions similar to those experienced on an orbital flight path to fully prove its systems and performance.

The writer, a contractor employed by ASRI, supports the Media Relations Office at Marshall. He covers NASA's X-33 and X-34 programs from Palmdale, Calif.

Jacks, Wales elected to Council

Marshall Center employees Bennie Jacks, AB11, and May Wales, AM01, have been elected and re-elected respectively to the NASA Exchange Council at the Marshall Center. Jacks and Wales will serve two-year terms.

They will join one other elected member, Larry Gagliano, EJ71, and four appointed members, Alex Roth, JA01, Exchange Council Committee chairman; Victoria Crawford, CO10; Charles Sullins Jr., BG01; and George Myers, ED12. The Exchange Council reported 1,304 ballots received in the Centerwide election.

May Wales

Bennie Jacks

NASA photo by Emmett Given

Black History Month celebration events continue

Marshall Employee Walter Robinson, playing saxophone, and guitar accompanist Eddie Alford, perform last Friday in the Bldg. 4203 cafeteria during the "Down Home Blues" lunch. Robinson and Alford entertained employees as part of Center events scheduled to celebrate Black History Month. Other events planned for the month include: "Down Home Blues" lunch 11:30 a.m. - 12:30 p.m. Friday in Bldg. 4610 cafeteria; Black History Month program 9 a.m. Wednesday, Feb. 17 in Morris Auditorium; Dr. Dorthy Huston, vice president of research and development at Alabama A&M University will speak and the Alabama A&M University Choir also will perform; Tour to the State Black Archives Research Center and Museum at Alabama A&M University 10 a.m.-noon Feb. 24. Contact Rita Evans-McCoy at 544-7507 for reservations.

Arsenal water safe

by Pam Rodgers

In response to recent news stories, U.S. Army officials want to reassure Marshall Center employees that Redstone Arsenal has a safe drinking water supply.

Redstone Arsenal was fined by the Environmental Protection Agency (EPA) for violations of the Safe Drinking Water Act in December 1996. The violations were the result of laboratory and administrative errors, and not due to the safety or quality of the water, according to the U.S. Army Aviation and Missile Command Environmental Management and Planning Office. This fine was levied and then agreed to by Redstone officials after lengthy negotiations with the EPA.

The Army agreed with the EPA to implement Supplemental Environmental Projects that will further enhance the quality of water supplied to employees, residents and visitors to Redstone.

The writer is a public affairs specialist with the U.S. Army Aviation and Missile Command, Redstone Arsenal.

Petersen named Dryden director

NASA Administrator Dan Goldin Monday named Kevin L. Petersen as director of NASA's Dryden Flight Research Center, Edwards, Calif. Petersen has been acting director of Dryden since Aug. 1, 1998. Previously, he had served as the Center's deputy director since January 1996.

"As director of the Agency's premier flight research center," Goldin said, "Kevin brings to the job a wealth of aeronautical experience, expertise and leadership at Dryden. This will be absolutely essential in guiding NASA into the next century with some of the most advanced research aircraft and aviation activities in the nation."

Since joining Dryden as an aerospace engineer in 1974, Petersen's experience has included work on F-8 Digital Fly-by-wire, Highly Maneuverable Aircraft Technology and X-29 forward-swept wing flight research projects. He also served as chief of the Vehicle Technology Branch and chief of the National Aerospace Plane projects office.

The Dryden Flight Research Center is chartered to conceive and conduct experimental flight research for integrated flight and propulsion controls; advanced optical sensors and controls; viscous drag reduction; advanced configurations; high-altitude, long-endurance aircraft; remotely piloted vehicle technology; hypersonic vehicle experiments; high-speed research for civil transportation; atmospheric tests of advanced rocket and air-breathing propulsion concepts; instrumentation systems; and flight loads predictions.

★ ★ ★ *Marshall Stars* ★ ★ ★

Thomas Bryan, EB44, has been recognized by the Flight Robotics Facility at Marshall for dedication and support of the Video Guidance Sensor tested as part of missions STS-87 and STS-95.

Charles Scales, CE01; Richard Robbins, AL21; Alex Adams, CR70; Alicia Beam, CE01; Alan Chow, EP62; Paulette Davy, CO20; Debie Grissom, AL31; Tony Parton, EP92; Linda Carpenter, AT01; Jim Pruitt, CO60; Caroline Wang, AI31; Howard Nelson, GP40; Pat Schultz, CO20; and LaVerta McGlathery, CO03, have been recognized as facilitators for the Marshall Center's Multicultural Diversity Program.

"Marshall Stars" is an occasional feature in the Marshall Star recognizing Marshall Center employees and contractors who have made significant contributions to NASA and the Marshall Center by taking significant strides in leadership and dedication to their professional and/or educational development.

Employees and contractors may nominate themselves or another employee. Submit your nominations for consideration to Angela Storey, CO40, or call 544-0030.

Employee Ads

Miscellaneous

★ Computer, 486/66MgHz, 14" Samsung monitor, 2 Gbytes, hardrive w/32 Mbytes ram, $400. 830-0866
★ Baseballs, 40 used, mostly Rawlings, $35 for all; Marantz speakers, 3-way, $40 for pair. 534-8186
★ Armoire desk, cherry finish, $300; solid oak bookcase headboard, queen size, $125. 971-2773
★ Brother word processor, desktop publishing software, 14" color monitor, color printing, modem port, $399. 353-3947
★ Brass bed, queen-size, night stand w/glass top, $175. 882-2323
★ Two tickets to "The King and I" matinee, Feb. 28, VBC, center loge, $30 each. 881-0278
★ Drawtite trailer hitch for 1985-1991 Buick LaSabre and Oldsmobile 98 series, $30. 881-0656
★ Oak china cabinet, bow front, 61" high, 31" wide, 14" deep. 536-8925
★ 1997 Astro 20' fish and ski boat, 200 HP, full canvas, fishfinders, ski equipment, GPS, $19,900 o.b.o. 922-1169
★ Laminated wood workbench tops, 2-1/4" thick by 42" wide, approximately 600', $10 per running foot. 232-7821, 7 a.m.-noon
★ Choate Ultimate rifle stock, 700REM, BDL S/A, aluminum bedding, adjustable, olive grab, any barrel, $100. (931) 438-0476
★ Surround sound, Onkyo Goldy Prologic, receiver with Bose accoustimas, seven speakers, $800. 656-4509
★ Aquarium, 45-gallon with wood cabinet stand, pumps, accessories, $150. 882-1566
★ Printer for Macintosh, Hewlett Packard Desk Writer 520, $70; ladies 10-spd. bike, $20. 883-4534
★ Four Camaro rally aluminum rims and tires, $300. 482-2901
★ 1989 Dynatrak fish/ski boat, 17.5', fully equipped, 90HP, $4,200 o.b.o. 784-9099
★ Diamond solitaire engagement ring, 1.02KT round, 18KT, 6-prong setting, size 6. 534-3783

Vehicles

★ 1994 Chrysler LHS, leather seats, CD player and changer, sunroof, maintenance records, $8,925. 722-0417
★ 1994 Nissian Pathfinder, SE V-6, auto, 4-wheel drive, sunroof, alarm, service records, $14,500. 837-5270
★ 1983 GMC van, custom interior, rebuilt motor, $1,600. 721-5609
★ 1996 Pontiac Transport, 7/8 passenger,cruise, PDL/PW, $10,600 o.b.o. 564-6225
★ 1993 Plymouth Grand Voyager, SE, 3.3L engine, 95K miles, air/tilt/cruise/tint, PB/PS. 881-0160
★ 1985 Oldsmobile Delta 88, 4 dr. sedan, 18K miles, $2,200. 729-8020
★ 1992 Ford Ranger, XLT package, extended cab, 4-L, V-6, automatic, A/C, 87K miles. 771-2002
★ 1990 Plymouth Voyager SE van, 3-dr., sky blue, 7-passenger, FM/AM cassette, power locks, $3,000. 881-5237
★ 1991 Volkswagon Fox GL, 4-dr., 4-spd., 74K miles, white, cruise, cassette, $1,950. 837-0085
★ 1998 Dodge 1500 SLT truck, quad cab, 12K miles, V-8, power, towing, $22,500. 882-5506

Wanted

★ Hooked on Phonics for tutoring foster children. 650-5096
★ Futon bed in good shape. 881-0883
★ Shopsmith band saw; 12' cattle trailer. 881-9426
★ Fondue pot. 534-4968

Found

★ One laser pointer, conference room 2002, Bldg. 4203. 961-1185

Center Announcements

☛ ***Shuttle Buddies* —** The Shuttle Buddies will meet for breakfast at 9:15 a.m., Monday, Feb. 22 at Shoney's on University Drive West.

☛ ***Volunteers sought* —** The Equal Opportunity Office at Marshall is seeking volunteers to chair and/or serve on the 1999 Take Our Children to Work committee. Interested employees should call Alicia Beam at 544-2849 or e-mail to: alicia.beam@msfc.nasa.gov

☛ ***Valentine Dinner Dance* —** Tickets for the Valentine Dinner Dance are on sale and available from MARS Ballroom Dance Club members. The semi-formal event, to be held Saturday, Feb. 13 at the Von Braun Center, will begin with a social at 6:30 p.m., a buffet dinner at 7 p.m., followed by dancing from 8-11:30 p.m. Ticket cost is $18 per person with a $3 discount for MARS Ballroom Dance Club members. **Contact:** Tamara Landers, 544-6818; Pat Sage, 544-5427; Ed Ogozalek, 837-1486; Linda Kinney, 544-0563; or Bob Williams, 544-3998. Reservations for a table of eight may be made by calling Woody Bombara at 650-0200.

☛ ***Conference* —** The 4th annual Technical Conference of the Association for Configuration and Data Management will be held March 29-April 1 at the Renaissance Waverly Hotel in Atlanta, Ga. The conference theme is "The new Paradigm — Thinking Out of the Box." Complete details of the conference may be found at the following Web site: http://www.acdm.org For more information, **contact** Brenda Sutherland at 544-6552; or Brenda Kyle at 955-1589.

☛ ***Vacation travel* —** Executive Tour & Travel Service Inc., through the NASA Exchange at Marshall, is offering a Disney/Epcot area hotel package of 4 days/3 nights for $139 for two adults and two children up to 12 years of age. A deposit of $70 is required by Feb. 26, however, travel dates are good through February 2000. Flyers are available at the Marshall Activities Bldg. 4752. For more information, **contact** Executive Tour & Travel at 1-800-272-4707. The NASA Exchange account reference is ER11583-005 and is available to Marshall employees, retirees and on-site contractors.

☛ ***Free symposium* —** A symposium, "Space Exploration at the Millennium, In Remembrance of Carl Sagan," will be held Wednesday, March 24, at American University in Washington, D.C. The symposium is free and open to the public, but seating is limited. Attendees may register at the following Web site: http://www.SPACE2000.org Event sponsors include NASA, Aerojet, American Airlines, American Astronautical Society, American University, D.C. Space Grant Consortium and Lockheed Martin. This symposium will present key figures of the 20th century creativity and achievement. It will offer a retrospective on one of this century's crowning accomplishments — The genesis of space exploration — and consider its future. The symposium also will include panel discussions, exhibits and displays, and small session meetings with panelists. Guests include: NASA Administrator Dan Goldin, Buzz Aldrin, Richard Berendzen, Avery Brooks, Yvonne Cagle, Andrew Chaikin, Franklin Chang-Diaz, Hugh Downs, Ann Druyan, Timothy Ferris, Louis Friedman, Don Herbert, Ted Koppel, John Logsdon, Howard McCurdy, Bill Nye, Fred Ordway, Ned Potter, Kim Stanley Robinson, Donna Shirley, Edward Stone, Kathy Sullivan and Jill Taylor.

☛ **AIAA luncheon —** An American Institute of Aeronatics and Astronautics luncheon will be Feb. 18 at the Redstone Officers' Club. The luncheon meeting will begin at 11 a.m. with a social, followed by lunch at 11:15 a.m. Center Director Art Stephenson will speak. Ticket cost is $10 and corporate table cost is $75, eight people. **Contact:** Tony Springer at 544-1571 or Tom Hancock at 941-4002.

☛ **Volunteers sought —** Volunteers are needed to help with the annual NASA Exchange-sponsored Easter Egg Hunt scheduled for 2 p.m. March 21. Children of Marshall employees and on-site contractors may participate. **Contact:** Gena Marsh at 544-0128 or Donna Mahieux at 544-7511.

MARSHALL STAR

Marshall Space Flight Center, Alabama 35812
(256) 544-0030

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Director of Internal Relations
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Managing Editor — Angela D. Storey
Writer-Editor — Ann Marie Bryk

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